3 Dimensional Solid Model Technical Data Packages

ARDEC

Configuration Mgt and LifeCycle Integration

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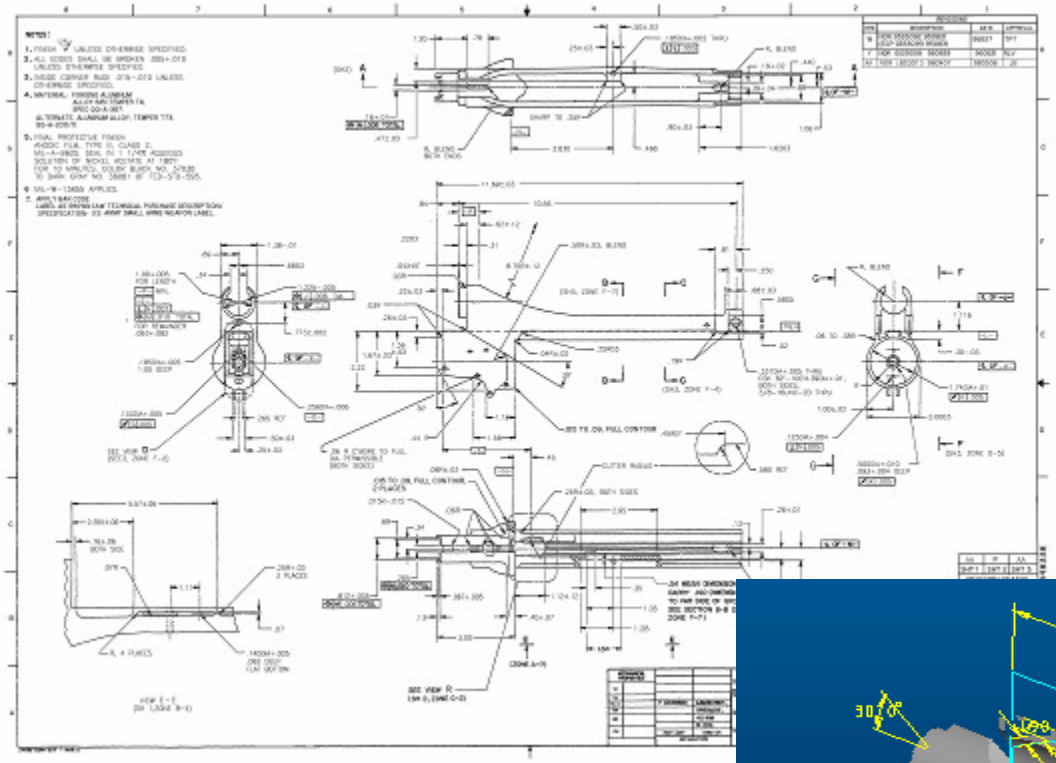
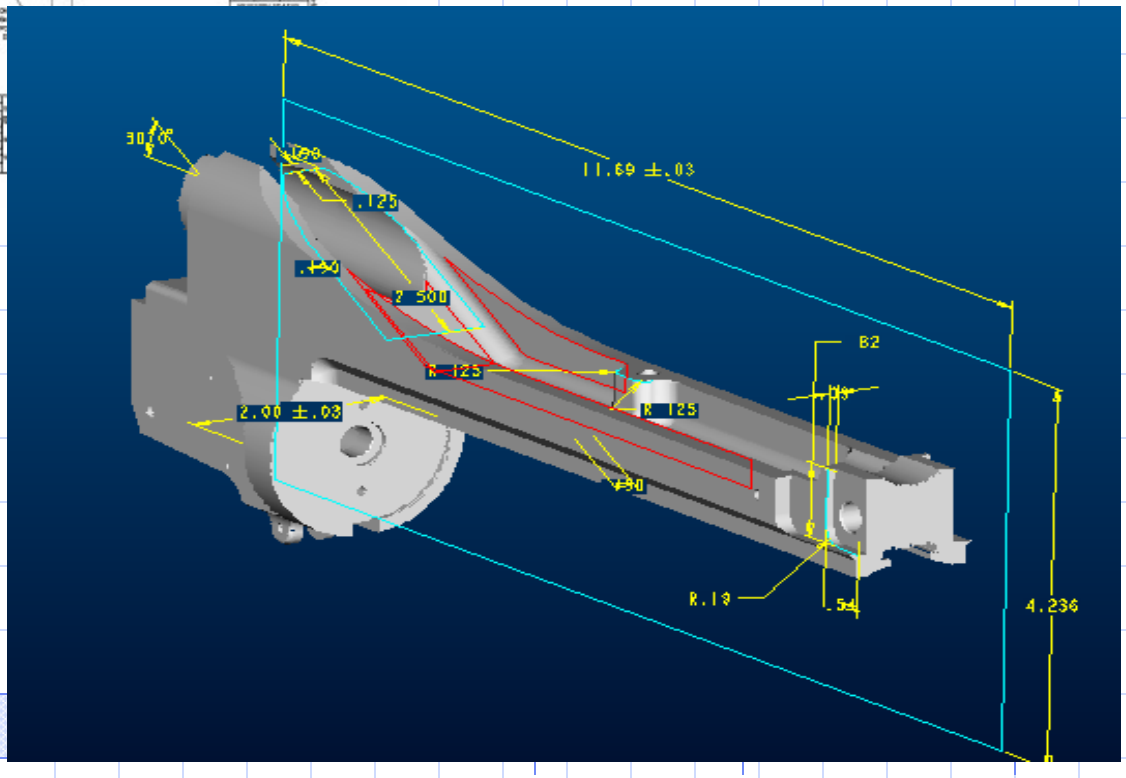
3D SOLID MODEL TDP's

- **Goal: To transform our technical data system based on 2-D raster images of line drawings, to a system based on 3-D solid models.**
- **Build infrastructure so that 3-D tech data can be used for production, design interface and upgrades, logistics support, etc.**

FROM THIS



TO THIS



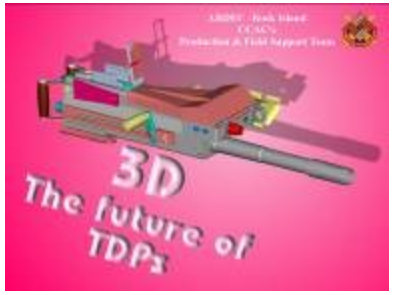
Advantages of 3D TDP's

- **Faster design upgrades**
- **Build virtual parts and assemblies in the computer**
- **Infinite viewpoints and exploded views of assemblies**
- **Reduced manufacturing lead time and cost**
- **Automated generation and update of line drawings**
- **Engineering analysis capabilities (stress, thermal, interference fit, tolerance stack-up, etc.)**
- **Rapid prototyping**

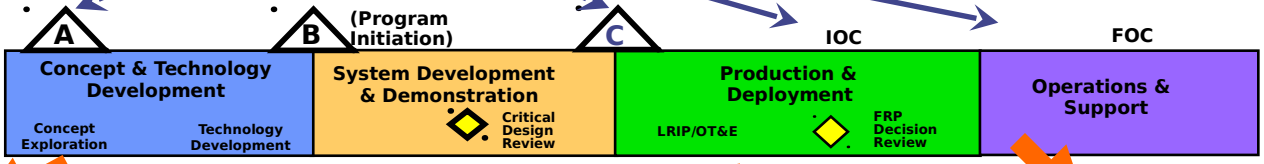
TACOM
Lethality, Survivability, Mobility and Sustainment for America's Army

Leadership
Teaming
Communication
Employee Support
Strategic Thinking
Organizational Climate

3D Tech Data Usage in the Lifecycle



3D Solid Model TDP Benefits thru the Lifecycle



Concept Exploration

Build virtual parts and assemblies in the computer

Explore multiple design alternatives

Infinite viewpoints and exploded views of assemblies

Virtual Reality Simulation

Reduces analysis and simulation time

Create rapid prototypes

System Development

Better and faster engineering analysis

- Stress analysis
- Mechanism design
- Interference fit
- Tolerance stack-up
- Fatigue analysis

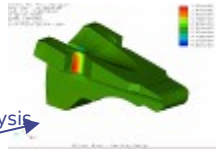
Design optimization

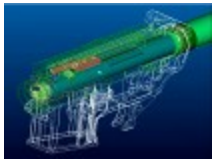
Improved interface with other systems

Automated generation and update of line drawings

Automated bill of material

Generate near perfect TDP





Production and Deployment

Faster and better manufacturing (reduced ALT & PLT)

Process Planning

Assembly Planning

Reduced TDP interpretation errors.

Tooling design

Models used to generate CNC codes

Investment casting

Mold Design

Sheetmetal Design

Routed Systems, Piping and Cabling Design

Sustainment

Technical manual development

Maintenance training

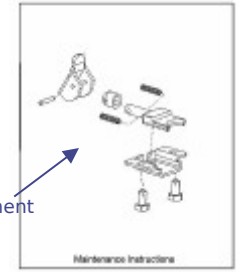
Faster design upgrades

Less time to update drawings

Increase competition in re-procurement

Save money on spare part purchases and completive re-buys

Better and faster problem analysis



3D TDP
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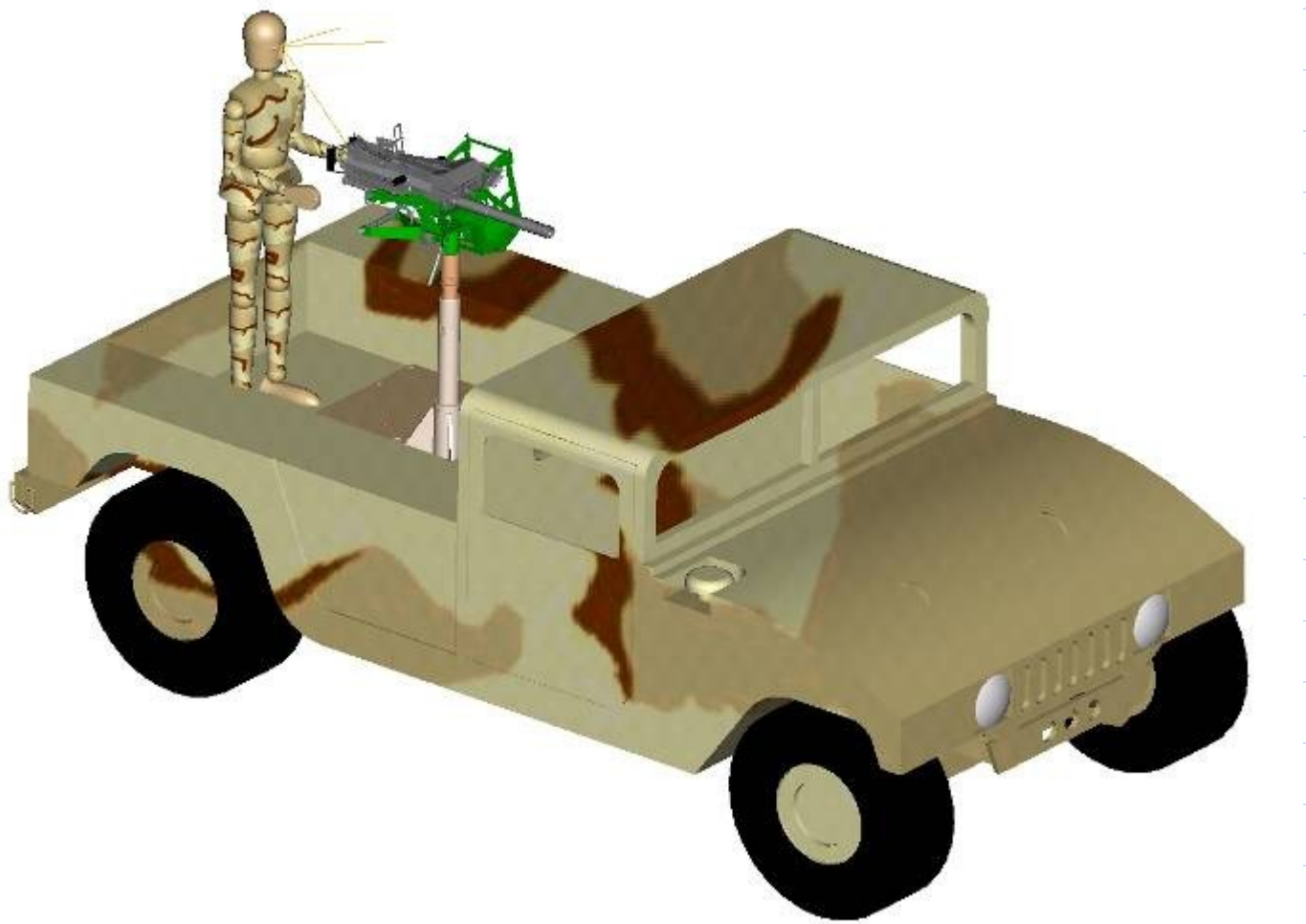
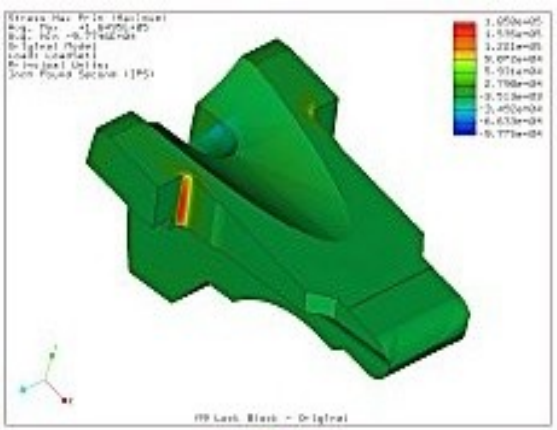
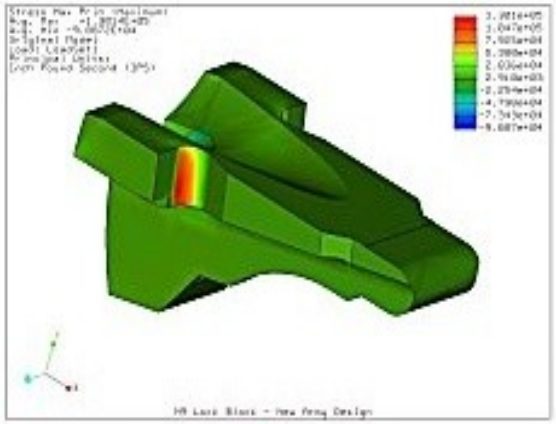
Collumd@ria.army.mil / windhamj@ria.army.mil

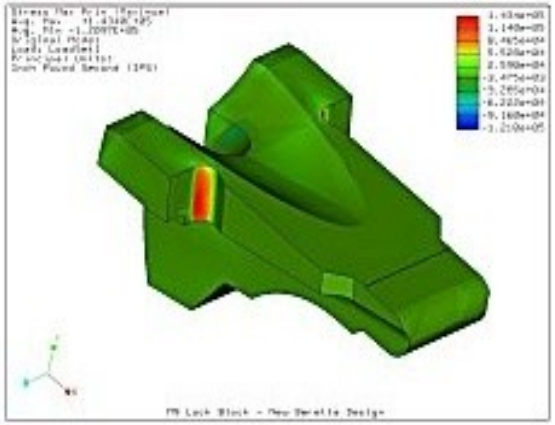
Design and Manufacturing

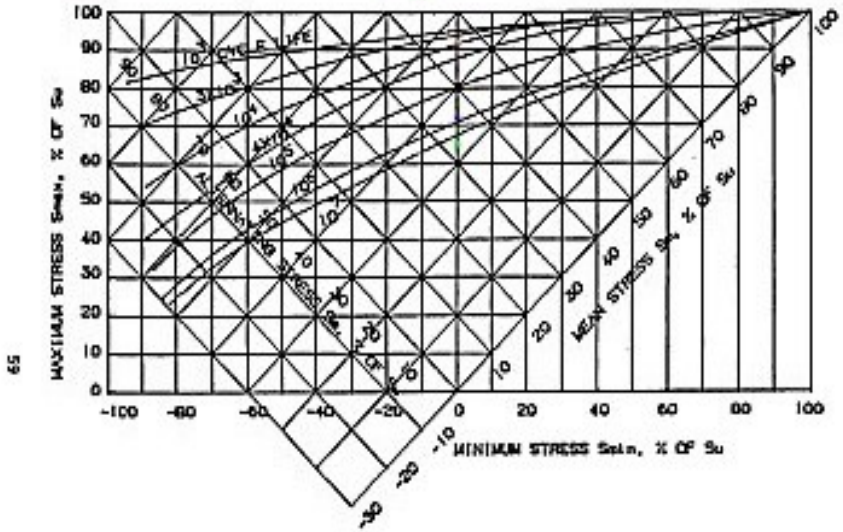


Engineering Analysis

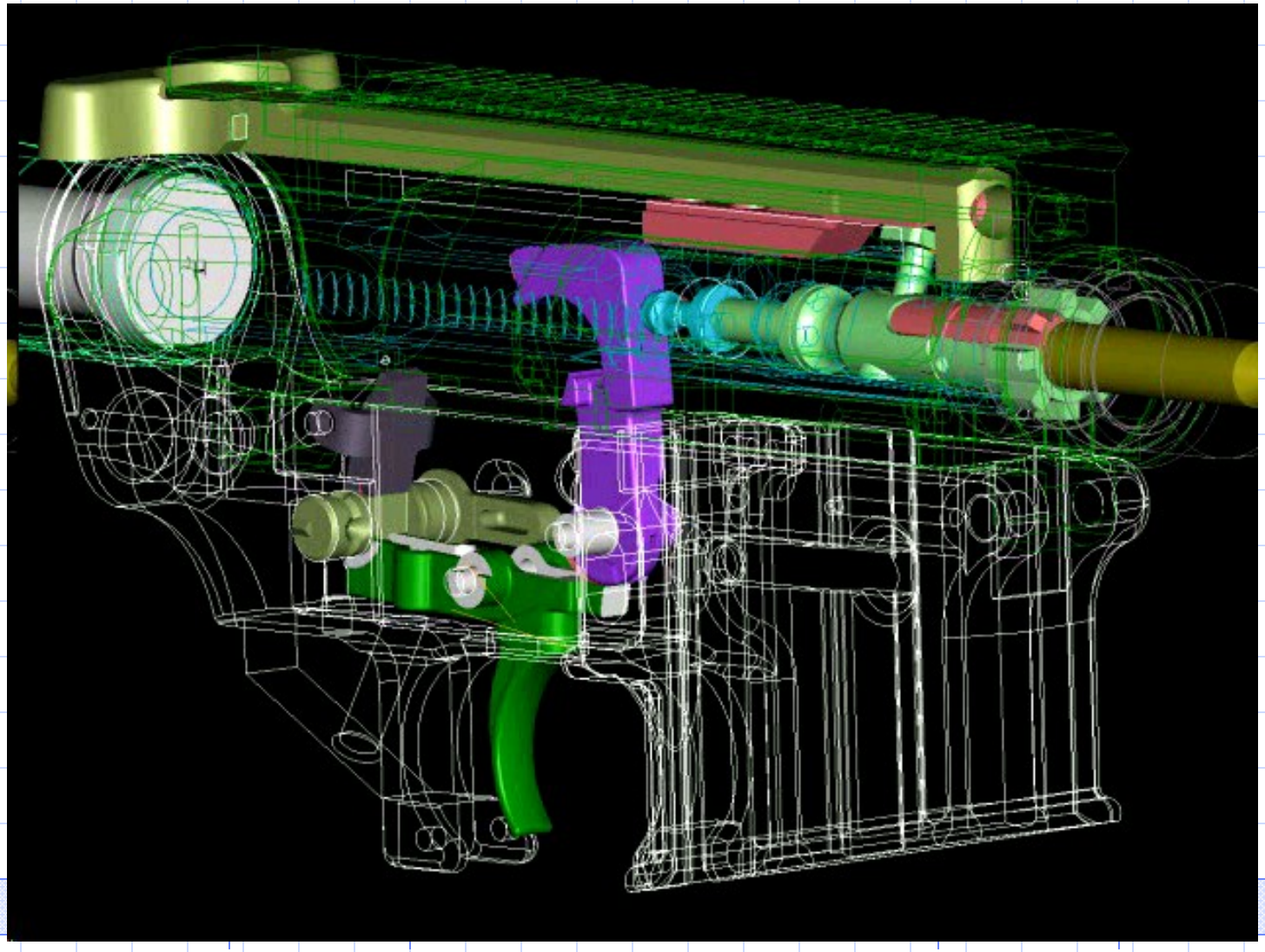




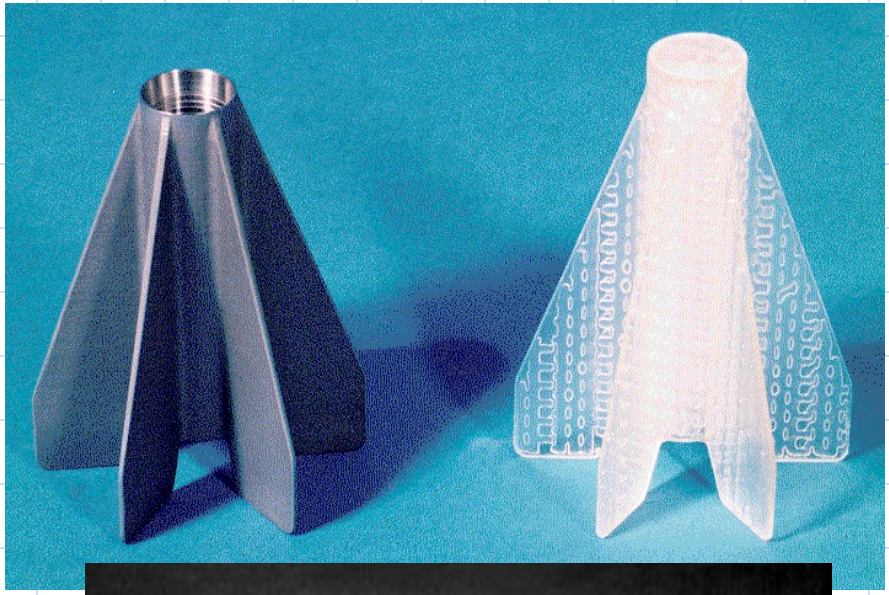


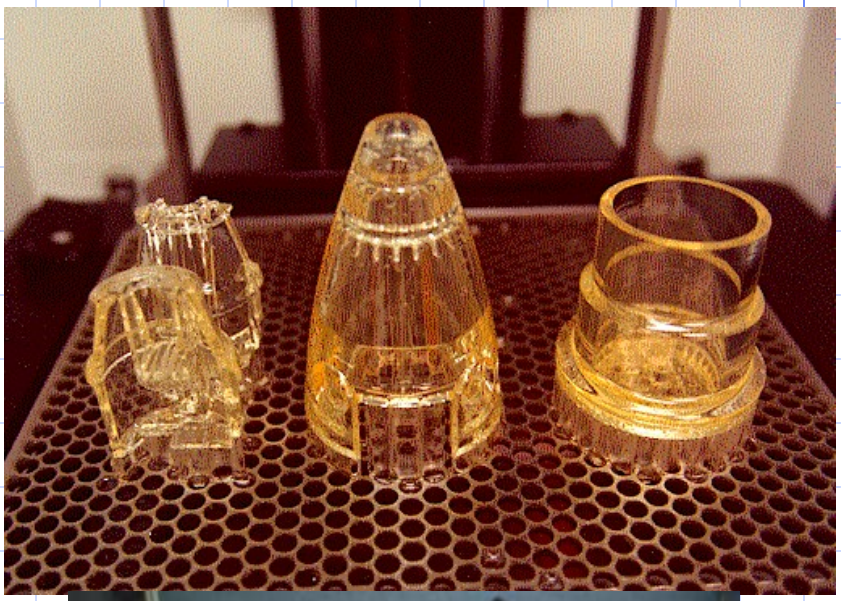


Dynamic Simulation

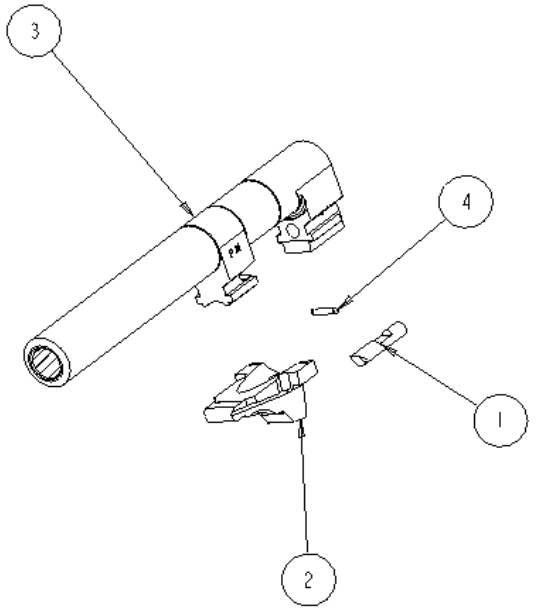


Rapid Prototype





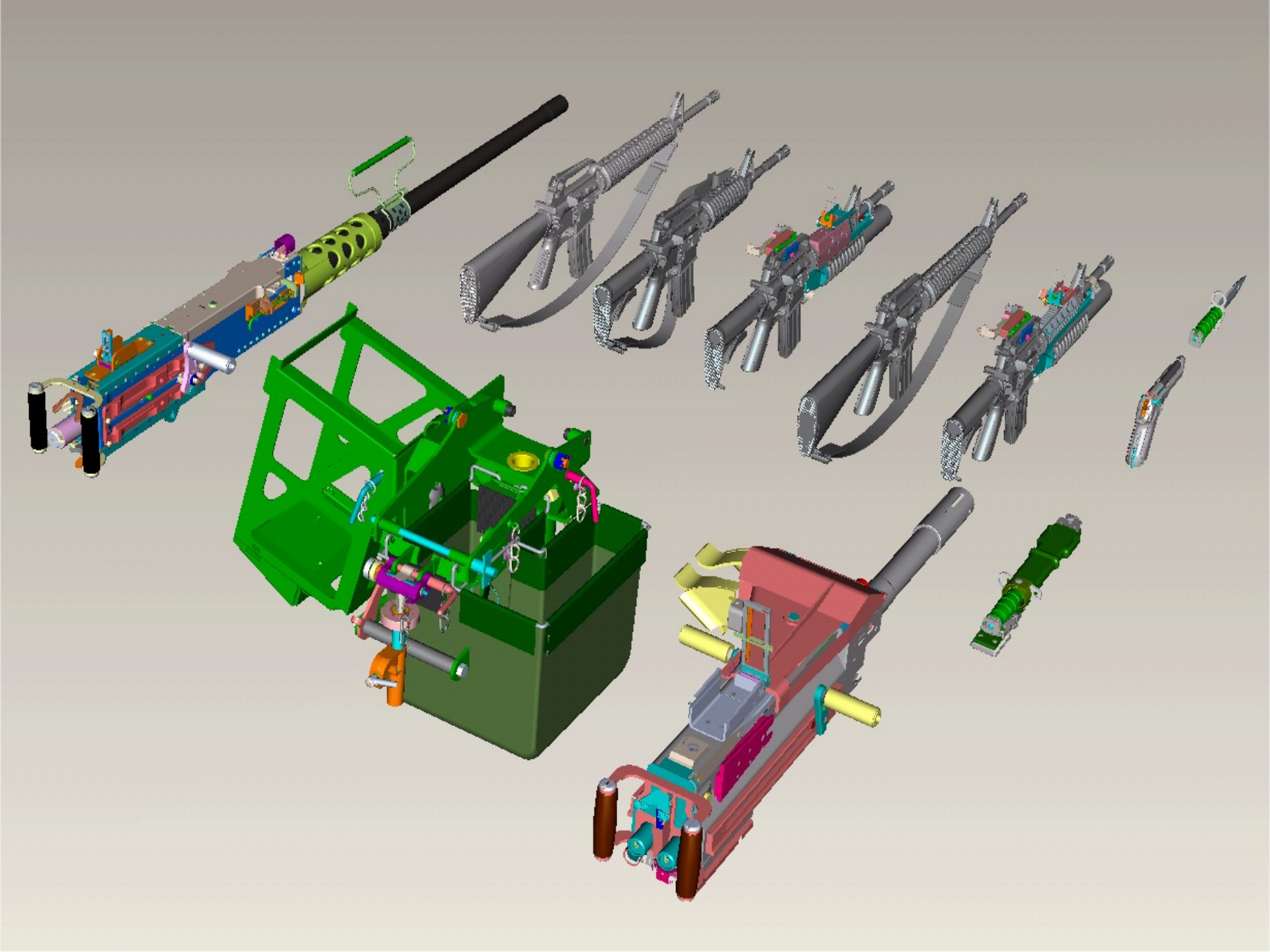
Create Technical Manuals



(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					M9 BARREL ASSEMBLY 9346422	
1		1005-01-204-4339	19200	9346424	PLUNGER, LOCKING BLOCK	1
2		1005-01-204-4340	19200	9346425	BLOCK, LOCKING	1
3		NONE	19200	9346426	BARREL, PISTOL	1
4		NONE	19200	D63477/8-5P	PIN, SPRING	1

GETTING TO A 3D ENVIRONMENT

- Convert current weapon/ammo systems when it makes good business sense.
- Obtain future system’s technical data in 3-D format.
- Low priority legacy systems will continue using 2D system.
- Performance specs (I.e. no tech data of any form) still an option when it makes sense.



TACOM/ARDEC 3D-TDP Policy

- **Establishes 3D solid model tech data as the preferred technical data format.**
- **ARDEC Policy signed by Geza Pap July 02.**
- **TACOM Policy signed by MG Thompson Mar 03.**
  - *"TACOM managers will ensure (3D) technical data is implemented to the maximum extent possible …"*
  - *"Sole use of 2D based technical data for products in development is strongly discouraged …"*

CHALLENGES

- CAD System interoperability:
  - Pro/E Catia
  - Unigraphics Solidworks
  - Solid Edge Mechanical Desktop/Inv
- Training.
- Most ARDEC Engineers not using modeling standards and storing models off-line.
- Interface with DLA and other services.

For more information contact:

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Windhamj@ria.army.mil

http://w4.pica.army.mil/ardec-ri/tacom_3d.htm